

Claims as amended during International Preliminary Examination

1. Method of thin film deposition by plasma, on the surface of an object to be treated, comprising the generation  
5 of plasma at atmospheric pressure in one or more inert plasmagenic gases and precursor gases, and projection of said plasma onto the surface to be treated, the precursor gas or gases comprising at least two components, a first of said components containing saturated organic substances and a  
10 second of said components containing unsaturated organic substances, the first component being a source of light radicals with a single free bond, subsequent to a plasmochemical process in the plasma zone, and the second component being a source of heavy radicals with two or more  
15 free bonds, the rate of flow of precursor gases being controlled to optimize the speed of film deposition and the gas and liquid barrier strength of the film.

2. Method as in claim 1, characterized in that the  
20 precursor gases contain carbon, hydrogen and halogens.

3. Method as in the preceding claim, characterized in that the halogen is fluorine and in that a layer of Teflon is deposited.  
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4. Method as in claim 1, characterized in that the precursor gases contain carbon and hydrogen.

5. Method as in the preceding claim, characterized in  
30 that a layer of polyethylene is deposited.

6. Method as in any of the preceding claims, characterized in that the object to be treated is an edible product.

5        7. Method as in any of the preceding claims, characterized in that the plasma is generated by pulses of electric current, the growth front and the duration of pulses being controlled in order to generate discharges that are not in thermodynamic equilibrium.

10       8. Method as in any of the preceding claims, characterized in that the plasma is sequentially supplied with different precursor gases in order to deposit a multilayer film, of variable composition over its thickness.

15       9. Device for implementing the method as in any of the preceding claims, characterized in that it includes plasma generators comprising electrodes to create the electric discharge supplied by a current source, and a system supplying  
20 at least two precursor gases, the generator being arranged in the enclosure of a reactor (14), the device also comprising a kinematical system to convey the objects to be treated through the plasma flow generated by the generators, the device operating under atmospheric pressure, characterized in that  
25 the kinematical system conveying the objects to be treated comprises a conveyor belt (23) in the form of a grid or mesh to allow surface treatment over the entire periphery of the object to be treated.

30       10. Device for implementing the method as in any of claims 1 to 8, characterized in that it includes plasma generators comprising electrodes to create the electric discharge supplied by a current source, and a system supplying

at least two precursor gases, the generator being arranged in the enclosure of a reactor (14), the device also comprising a kinematical system to convey the objects to be treated through the plasma flow generated by the generators, the device  
5 operating at atmospheric pressure, characterized in that the device comprises guiding elements (24) to guide the flow of objects to be treated through the plasma flows of the plasma generators arranged along the reactor, the conveying of the objects to be treated being made under gravity or hydrodynamic  
10 flow.

11. Device as in claim 10, characterized in that the treatment is conducted on the surface of objects of small size accumulated in a container through which, from bottom to top,  
15 the plasma-derived gases flow so as to form a boiling layer ensuring treatment of the entire surface of each of the objects.